COOLING SYSTEM—3.0L VULCAN ENGINE ONLY—VARIOUS COOLANT RELATED SYMPTOMS—CONTAMINATED OR DISCOLORED COOLANT	Article No. 01-11-6

FORD: 1996-1999 TAURUS

MERCURY: 1996-1999 SABLE

NOTE

THIS ARTICLE DOES NOT APPLY TO GULF COAST COUNTRY (GCC) VEHICLES EQUIPPED WITH ENGINE OIL COOLER. A SEPARATE TSB WILL BE RELEASED SOON FOR THESE APPLICATION.

ISSUE

Some vehicles may exhibit cooling system conditions such as:

- Contaminated/corroded coolant
- Leaking/Cracked/Discolored Coolant Overflow bottles
- Vibration or thumping from engine
- Leaking heater core
- Coolant overflow
- High temperature gauge readings
- Fluctuating temperature gauge
- Stuck Thermostat
- Heater hose leaks
- Leaking head gasket
- Lack of heat

This may be caused by:

- Coolant level that falls below the cold fill range due to un-serviced leaks, improper fill after service and lack of coolant level maintenance that may lead to cooling system overheat damage.

NOTE

IT IS RECOMMENDED THAT THE COOLANT CAN BE SAFELY FILLED TO THE TOP OF THE CLEAR PORTION OF THE BOTTLE (WHEN THE ENGINE IS COLD) TO PROVIDE EXTRA RESERVE COOLANT. (FIGURE 11).

- Bank to bank coolant flow imbalance on some 1996-98 model year vehicles.

ACTION

Perform the following repairs based on model year application. Check repair history to determine if prior repairs were performed.

- 1996-97 3.0L Vulcan - If bypass kit was previously installed, then install new water pump (1F1Z-8501-AA) and perform the entire SEDIMENT/CHEMICAL FLUSH and fill procedure. If bypass kit was NOT previously installed, Install coolant bypass kit (F7DZ-8522-AB) OR (METHONAL VEHICLES F8DZ-8522-CC), new water pump (1F1Z-8501-AA) and perform the entire SEDIMENT/CHEMICAL FLUSH and fill procedures.
- 1998 3.0L Vulcan - Install Coolant bypass kit (F8DZ-8522-BA) on vehicles built 9/1/1997 - 1/23/1998. Install water pump (1F1Z-8501-AA) on all 1998 models regardless of build date. Perform the entire SEDIMENT/CHEMICAL FLUSH if bypass kit was NOT previously installed. If bypass was previously installed or vehicle is outside the coolant bypass build range the CHEMICAL FLUSH and Fill procedure may be sufficient.
- 1999 3.0L Vulcan - Perform FLUSH AND FILL PROCEDURE AND CHEMICAL FLUSH ONLY.

SERVICE PROCEDURE

1. Perform normal diagnostics as outlined in the Cooling System Symptom charts located in the appropriate model year Workshop Manual. Service as required.
2. If not previously installed, install appropriate Coolant By-Pass Kit. Refer to the Instruction sheet included in the kit for details.
3. Install water pump on 1996-98 models only. Refer to Workshop manual, Section 03-01A for replacement details.
4. Perform the following flush and fill procedures if coolant is discolored.

Copyright © 2001 Ford Motor Company

FLUSH AND FILL PROCEDURE RECOMMENDED TOOLS

The tools shown in Figure 1 are referenced throughout the technical Instruction to facilitate the flush procedures. Tools should be obtained locally.

FLUSH AND FILL PROCEDURE

NOTE
POSITION THE VEHICLE ON A HOIST WHERE A GARDEN HOSE CAN BE USED AND COOLANT CAN BE DISCARDED.

WARNING
COOLANT MAY BE HOT. REMOVE COOLANT PRESSURE RELIEF CAP.

1. Raise vehicle on hoist.
2. Remove splash shield.
3. Remove Radiator draincock and completely drain and discard coolant.
4. Lower vehicle.
5. Loosen alternator brace retaining nuts and position brace away from heater return hose (Figure 2).
6. Turn Heater and Blower Switches to off.
7. Disconnect heater return hose from water pump and discard clamp.
8. FOR 96, 97 AND SOME 98 MODEL YEAR VEHICLES PROCEED WITH THE SEDIMENT AND CHEMICAL FLUSH PROCEDURES. FOR 99 MODEL YEAR, COMPETE THE CHEMICAL FLUSH PROCEDURE ONLY.

SEDIMENT FLUSH PROCEDURE

9. Disconnect upper radiator hose from thermostat housing and discard clamp.
10. Using clamping pliers, clamp off coolant by-pass hose at center of hose (Figure 3).
11. Raise and support vehicle.
12. Remove engine block core plug located next to the oil filter. On the opposite side of the engine block, there are two core plugs; remove the engine block core plug closest to the water pump.
13. Remove lower radiator support bracket that covers lower radiator hose.
14. Remove lower radiator hose from radiator and discard clamp.
15. Clean core plug bores in cylinder block with sand paper drum (Fine 150-grit 1.5″ dia.). Ensure all Loctite and rust is removed from core plug bore.
16. Lower vehicle.
17. Connect garden hose to heater return hose using adapter (Figure 4).
18. Turn garden hose on full pressure.
19. Flush engine/heater core for ten (10) minutes. Water will drain out of core plug holes.
20. Disconnect garden hose from heater return hose.
21. Insert garden hose into upper radiator hose (Figure 5).
22. Flush radiator for two (2) minutes. Water will drain out of lower radiator hose connection and draincock.
23. Remove garden hose from upper radiator hose.
24. Insert garden hose into coolant recovery bottle (Figure 6).
25. Flush coolant recovery bottle for four (4) minutes. Water will drain out of lower radiator hose.
26. Remove garden hose from coolant recovery bottle. Let cooling system completely drain before proceeding to next step.
27. Remove clamping pliers from coolant by-pass hose.
28. Install new screw clamp on upper radiator hose. Connect upper radiator hose to thermostat housing and tighten clamp.
29. Raise and support vehicle.
30. Lubricate O-rings of new engine core plugs (-6C057-) with silicone dielectric grease (WA-10).
31. Install left and right bank front engine core plugs. Index dimples on the plugs to 12 o'clock position. (Figure 7).

NOTE
DO NOT OVER TORQUE.

32. Tighten core plug retaining nuts to 3.2 N•m (28 lb-in). See Figure 7. Use 1/4″ drive, 8mm flex socket with a long extension is acceptable. Make sure plugs do not rotate when tightening retaining nut.
33. Install new screw clamp on lower radiator hose. Connect lower radiator hose to radiator and tighten clamp.
34. Install lower radiator support bracket. PROCEED TO STEP 36 and continue.

CHEMICAL FLUSH PROCEDURE

WARNING
WEAR RUBBER GLOVES DURING THIS STEP. CHEMICAL CLEANER MAY CAUSE SKIN IRRITATION.

35. Partially raise vehicle.
36. Install radiator draincock.
37. Lower vehicle.
38. DO NOT add chemical cleaner to the coolant recovery bottle. Using a funnel, slowly add one (1) bottle of chemical cleaner (F8AZ-19A503-AA) into the HEATER RETURN HOSE (Figure 8).

NOTE
THE RECOMMENDED CHEMICAL CLEANER MUST BE USED.

39. Connect and clamp the heater return hose to the water pump fitting.
40. Slowly fill cooling system with water. Squeeze upper radiator hose to purge air from system as water is added. Coolant level must be filled to the top of the clear portion of the coolant recovery bottle to completely clean the coolant bottle.
41. Start engine and raise RPM to 2000 RPM for 2 minutes. Do not exceed 2500 RPM.
42. Check cooling system for leaks.
43. Recheck coolant level. Add water, if necessary to bring level up to the top of the clear portion of the bottle.
44. Install coolant bottle pressure relief cap.
45. Run engine at idle until upper radiator hose is hot (when thermostat opens) approximately 12 minutes.
46. Turn engine off and let chemical solution soak for a minimum of thirty (30) minutes, while engine cools.

WARNING
COOLANT MAY BE HOT. REMOVE COOLANT PRESSURE RELIEF CAP.

47. Partially raise vehicle.

WARNING
WARNING WEAR RUBBER GLOVES FOR THIS STEP. CHEMICAL CLEANER MAY CAUSE SKIN IRRITATION.

48. Remove radiator draincock.
49. Completely drain chemical solution and discard.
50. Lower vehicle.
51. Disconnect heater return hose from water pump fitting (Figure 9).
52. Install a 3/4″ I.D. rubber cap on the water pump heater hose fitting (Figure 9).
53. Disconnect and plug radiator overflow hose from coolant recovery bottle. Discard clamp (Figure 10).
54. Attach a 4 foot section of 3/8″ vinyl hose to overflow fitting on the coolant recovery bottle. Let vinyl hose hang over fender (Figure 10).
55. Install coolant pressure relief cap.
56. Connect garden hose (water supply) to heater return hose using 3/4″ adaptor.
57. Turn garden hose on full pressure.
58. With engine off, flush engine for at least five minutes and until water is clear. Water will drain out of radiator draincock and the 4 foot vinyl hose.
59. Turn garden hose off and remove pressure relief cap from bottle.
60. Disconnect garden hose from heater hose. Let cooling system completely drain before proceeding.
61. Raise vehicle.
62. Install and tighten draincock.
63. Install splash shield.
64. Lower vehicle.

65. Remove rubber cap from the water pump.
66. Install new screw clamp on heater return hose and reconnect to water pump. Tighten clamp.
67. Reattach and secure alternator brace.
68. Remove 3/8″ vinyl hose.
69. Unplug radiator overflow hose and install new screw clamp. Reconnect radiator overflow hose to coolant recovery bottle and tighten clamp.
70. Add one (1) bottle (16 oz) of heavy duty cooling system additive (FW-16) to coolant recovery bottle.
71. Add six (6) quarts of new coolant to coolant recovery bottle. Fill remainder of cooling system with water to top of clear lower portion of coolant recovery bottle.
72. Start engine and top off with water to top of clear lower portion of coolant recovery bottle (Figure 11).

NOTE
THE NEXT STEP MUST BE DONE BEFORE THERMOSTAT OPENS.

73. Raise engine RPM to 3000 RPM for 30 seconds and check for foaming inside the coolant recovery bottle. If foaming is present the coolant by-pass restrictor has not been installed. Turn off engine and install the coolant by-pass restrictor (F7PE-8N030-AA) contained in 1996-1997 bypass kit (F7DZ-8522-AB). Refer to coolant by-pass restrictor installation procedure in the bypass kit instructions.
74. Install coolant pressure relief cap.
75. Select maximum heater temperature and blower motor speed settings. Position control to discharge air from the instrument panel vents.
76. When vehicle reaches normal operating temperature, verify hot air from panel vents and a hot upper radiator hose.
77. CAUTION: If air discharge remains cool and engine coolant temperature gauge does not move, engine coolant level is low and must be filled. Stop engine, allow to cool and fill cooling system to top of clear lower portion of coolant recovery bottle.
78. Start engine and allow it to idle until normal operating temperature is reached. Hot air should discharge from panel vents. The engine coolant temperature gauge should maintain a stabilized reading within the NORMAL range and upper radiator hose should feel hot to touch.
79. Shut engine off and allow engine to COMPLETELY COOL.
80. Check engine for coolant leaks.
81. IF NECESSARY, ADD COOLANT UNTIL LEVEL IS AT THE TOP OF THE CLEAR PORTION OF THE COOLANT BOTTLE (FIGURE 11).
82. INFORM CUSTOMER THE IMPORTANCE OF MAINTAINING COOLANT LEVEL. IT'S RECOMMENDED THAT COOLANT CAN BE SAFELY FILLED TO THE TOP OF THE CLEAR PORTION OF THE COOLANT BOTTLE WHEN THE ENGINE IS COLD. THIS PROVIDES EXTRA RESERVE COOLANT.

PART NUMBER	PART NAME
F8AZ-19A503-AA	Chemical Cleaner
FW-16	Coolant Conditioner
VC-4A	Engine Coolant
F7DZ-8522-AB	Coolant By-Pass Kit - 96-97 Taurus/Sable
F8DZ-8522-BA	Coolant By-Pass Kit - 98 Taurus/Sable
F8DZ-8522-CC	Coolant By-Pass Kit - 96-97 Methonal Taurus/Sable
1F1Z-8501-AA	Water Pump - 96-98 Taurus/Sable
F8DZ-6C057-AA	Core Plug

OTHER APPLICABLE ARTICLES: NONE
SUPERSEDES: 97-24-16, 99-6-8
WARRANTY STATUS: Eligible Under The Provisions Of Bumper To Bumper Warranty Coverage

OPERATION	DESCRIPTION	TIME
011106A	Replace Water Pump (Includes Time To Perform Sediment And Chemical Flush And Fill Procedures) 1996-1998 3.0L MFI, 3.0L FFV	4.1 Hrs.
011106B	Replace Water Pump And Install By-Pass Kit (Includes Time To Perform Sediment And Chemical Flush And Fill Procedures) 1996-1998 3.0L MFI, 3.0L FFV	4.6 Hrs.
011106C	Perform Chemical Flush And Fill Procedures 1998-1999 3.0L MFI, 3.0L FFV	1.6 Hrs.

DEALER CODING

BASIC PART NO.	CONDITION CODE
8A080	49

OASIS CODES: 204000, 204200, 206000, 208000, 208100, 208999, 402000, 497000, 499000

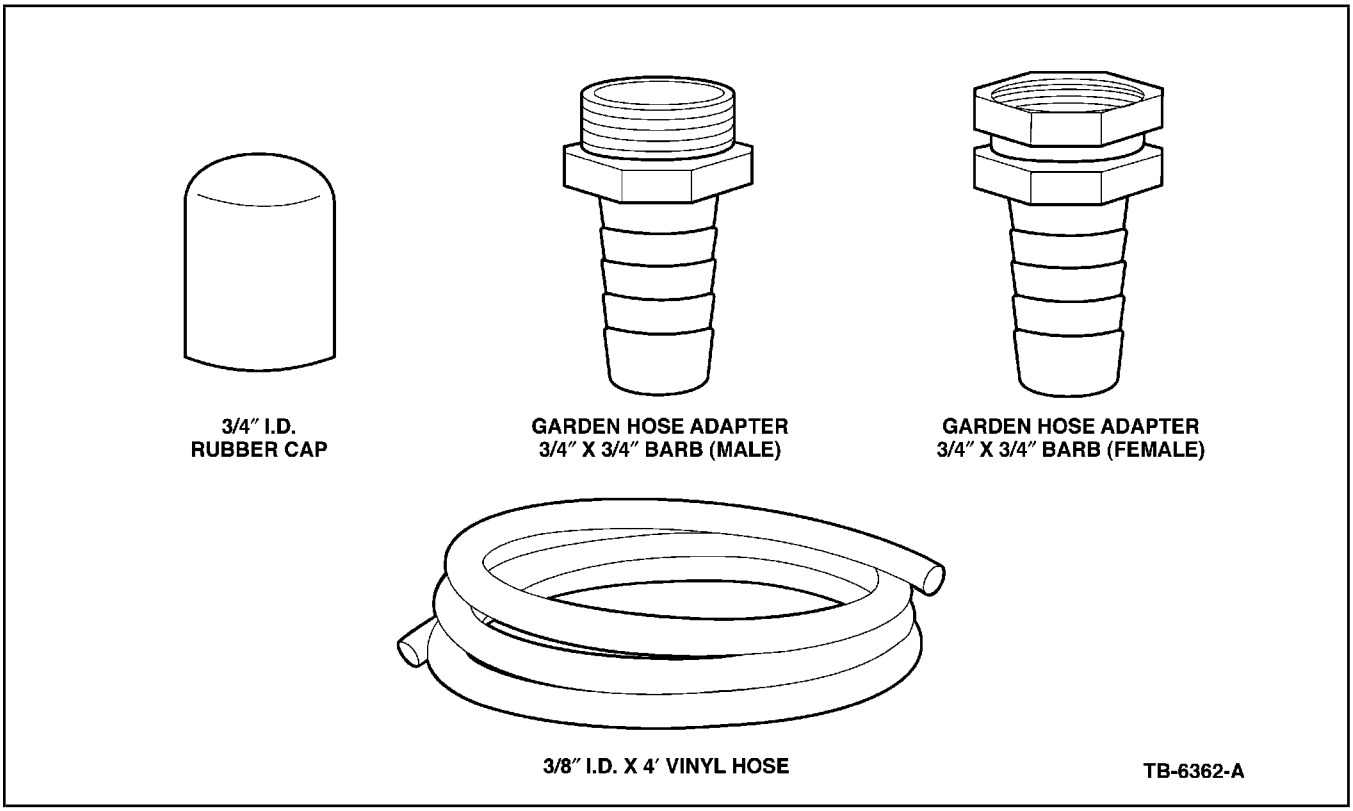

Figure 1 - Article 01-11-6

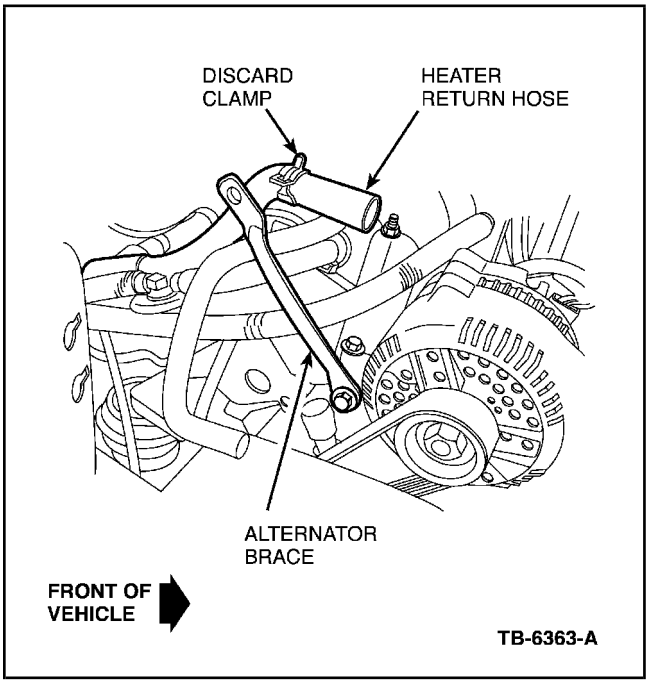

Figure 2 - Article 01-11-6

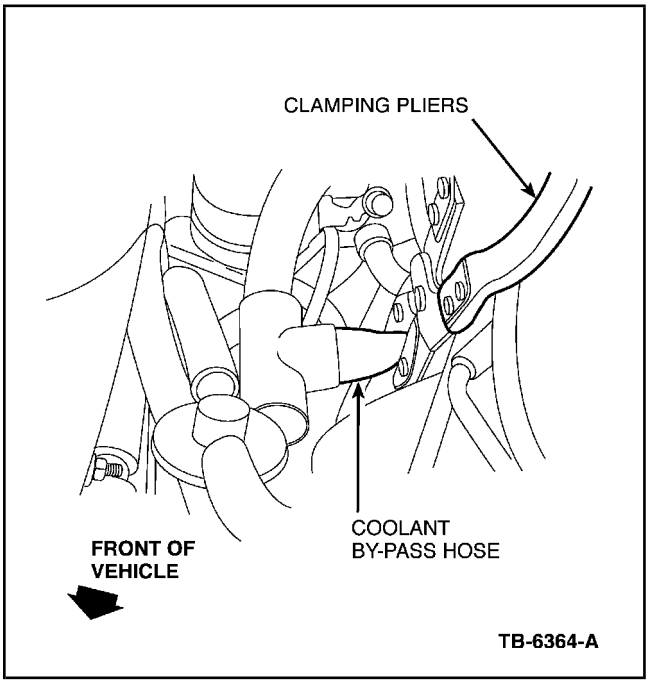

Figure 3 - Article 01-11-6

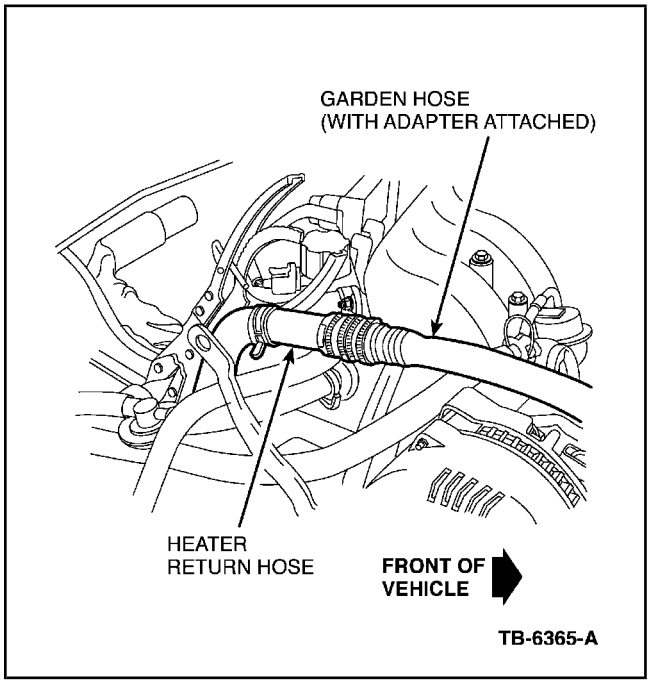

Figure 4 - Article 01-11-6

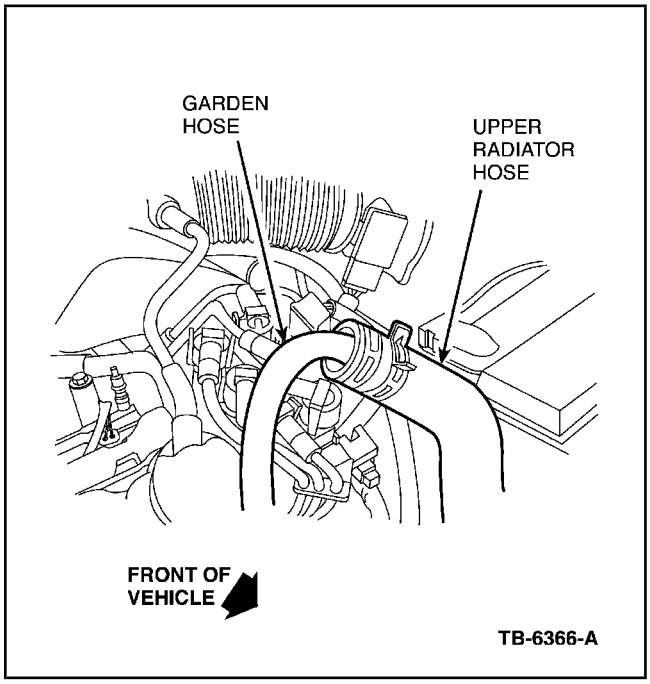

Figure 5 - Article 01-11-6

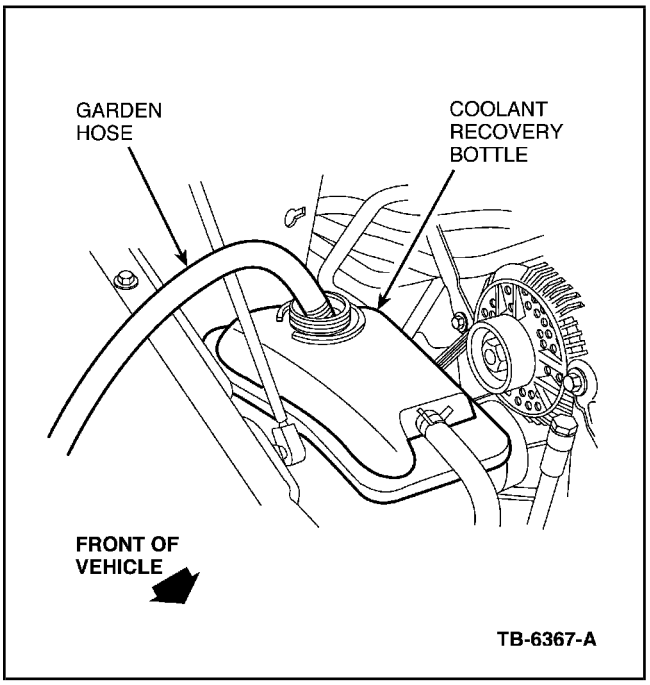

Figure 6 - Article 01-11-6

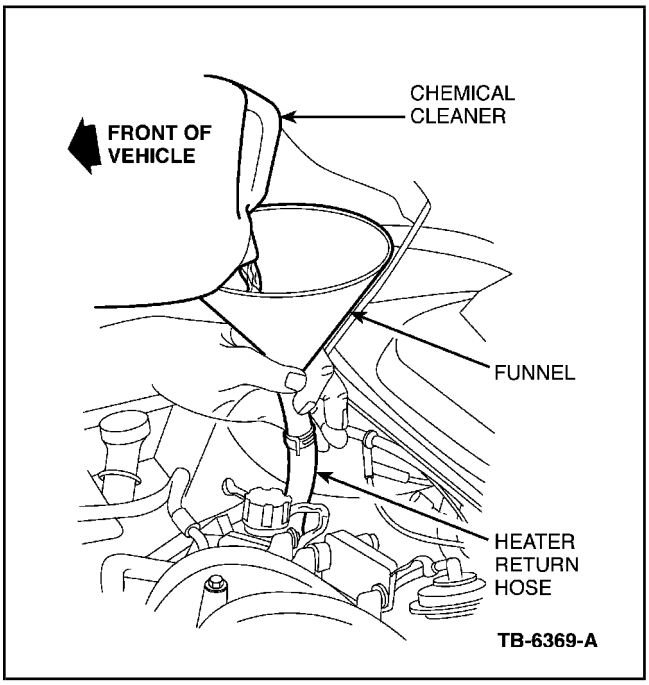

Figure 8 - Article 01-11-6

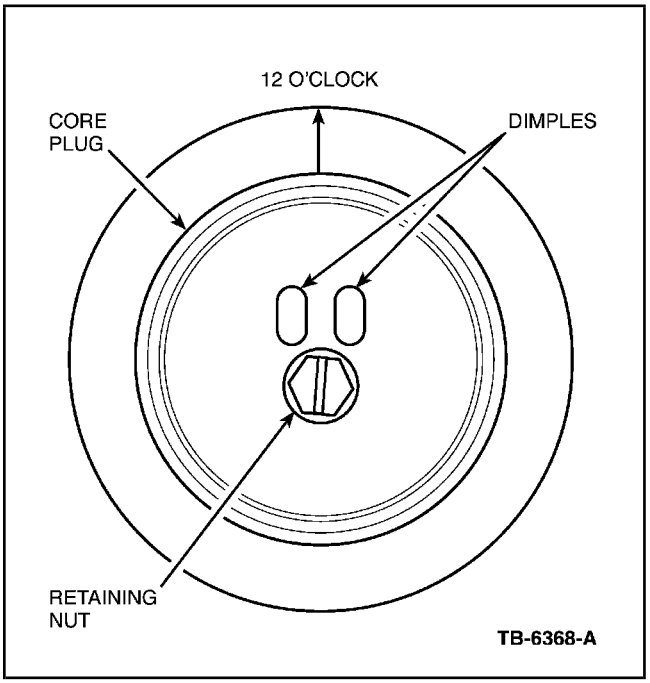

Figure 7 - Article 01-11-6

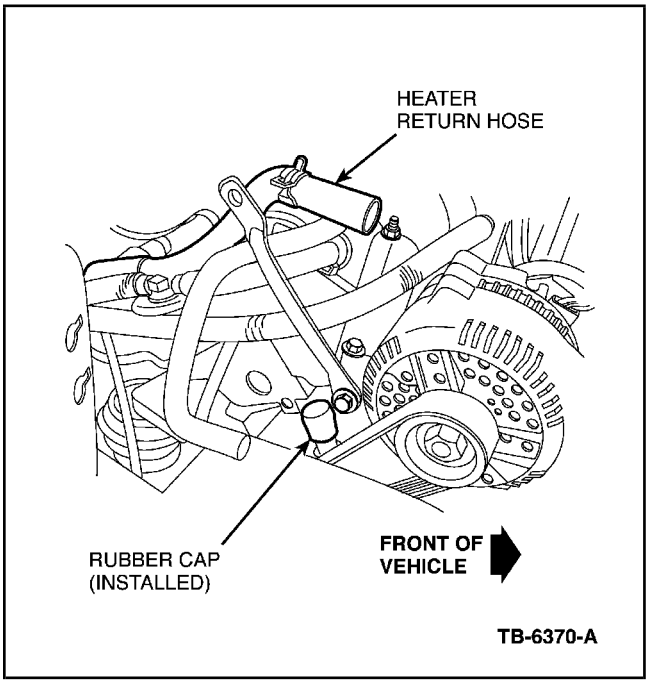

Figure 9 - Article 01-11-6

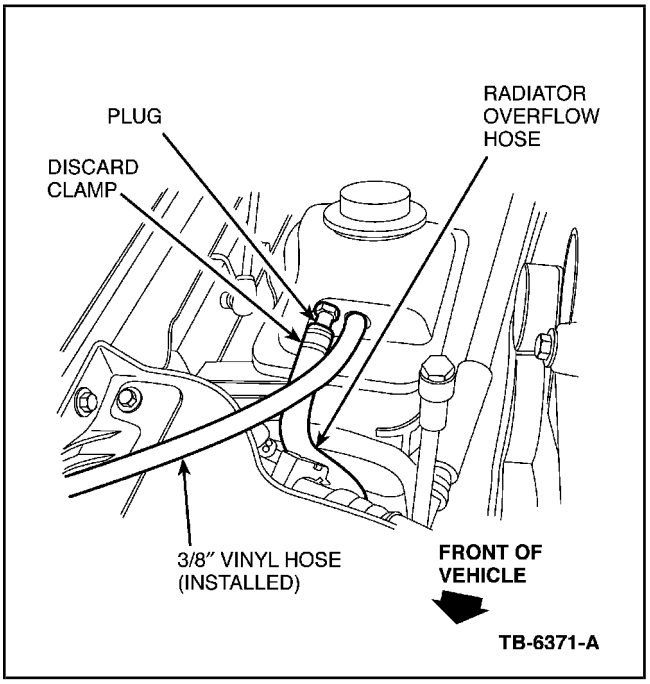

Figure 10 - Article 01-11-6

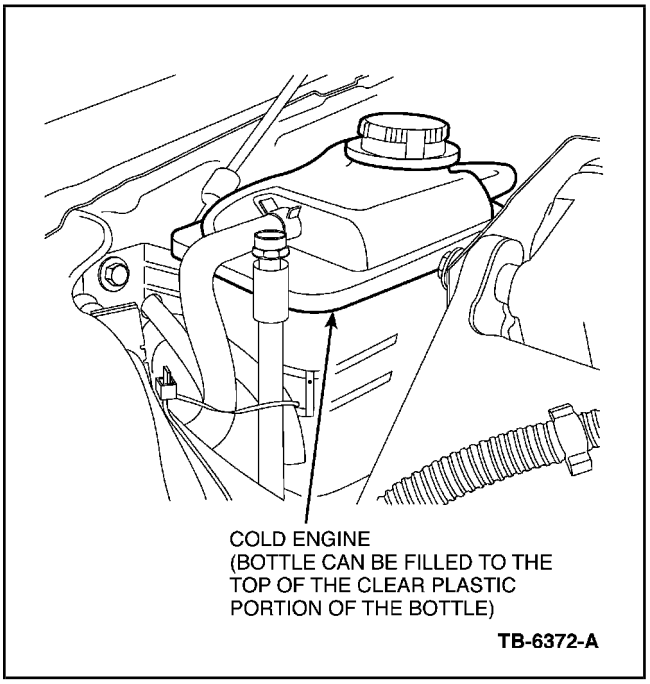

Figure 11 - Article 01-11-6

The following is an excerpt from a "Dealer Letter" regarding Owner Notification Program 98B18 which addressed the Brown Coolant issue.

ATTACHMENT III
Owner Notification Program 98B18

COOLING SYSTEM INSPECTION AND FLUSHING

AFFECTED VEHICLES:

CERTAIN 1996-1997 MODEL YEAR TAURUS AND SABLE VEHICLES EQUIPPED WITH 3.0L VULCAN ENGINES

INSPECTION

1. Open hood.
2. Check for presence of coolant by-pass hose shown in Figure 1.
    - If coolant by-pass hose is present, no service action is required. Return vehicle to customer.
    - If coolant by-pass is not present, proceed to service procedure.

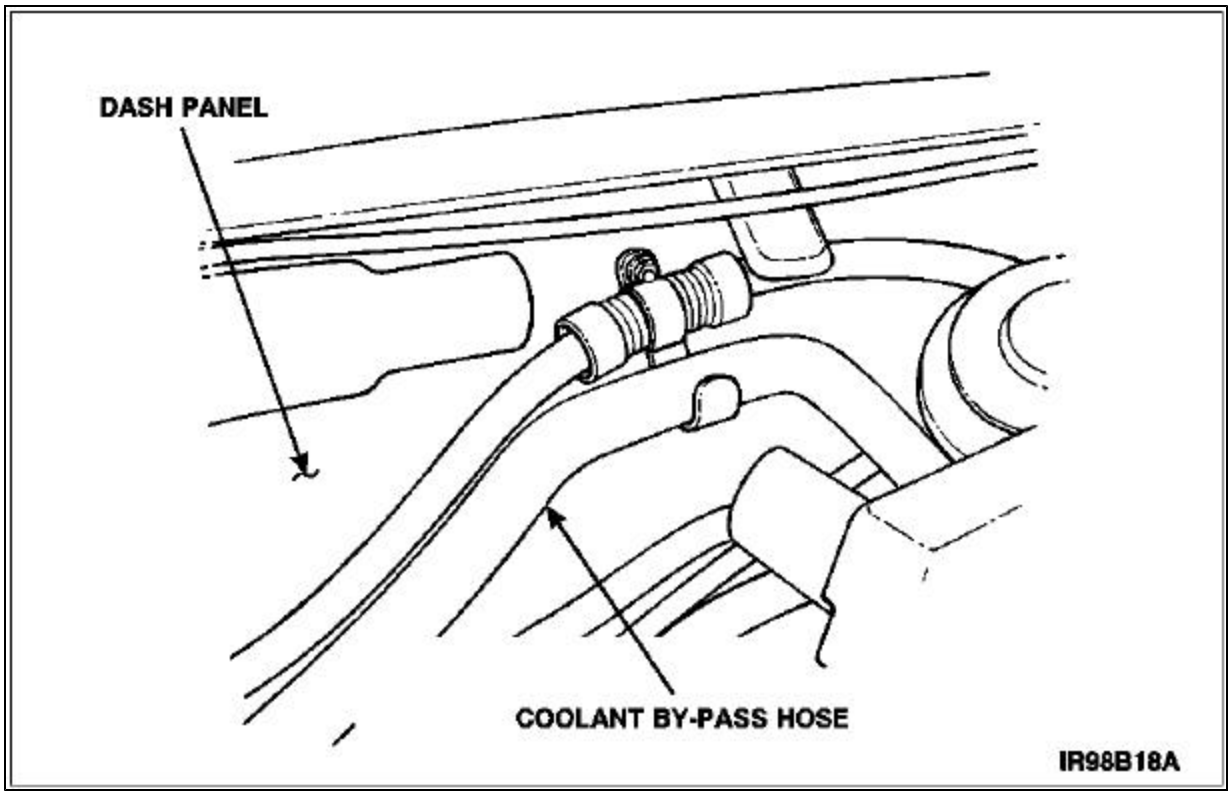

Figure 1

3. Check vehicle mileage.
    - If vehicle mileage is 10,000 miles or more and heavy discoloration (rust) is noted in the coolant, the cooling system must be flushed during the service procedure.
    - If the vehicle mileage is under 10,000 miles, only a cooling system drain and fill is necessary.

SERVICE PROCEDURE

1. Raise vehicle.
2. Remove splash shield.
3. If vehicle mileage is 10,000 miles or more and heavy discoloration (rust) is in the coolant, completely drain and discard cooling system fluid. Then flush cooling system with water as outlined in the 1996/97 Taurus/Sable Service Manual, Section 03-03.
4. If the vehicle mileage is under 10,000 miles, completely drain and discard cooling system fluid.
5. Close radiator draincock.
6. Lower vehicle.
7. Remove clean air tube.
8. Remove coolant recovery hose from fitting shown in Figure 2.

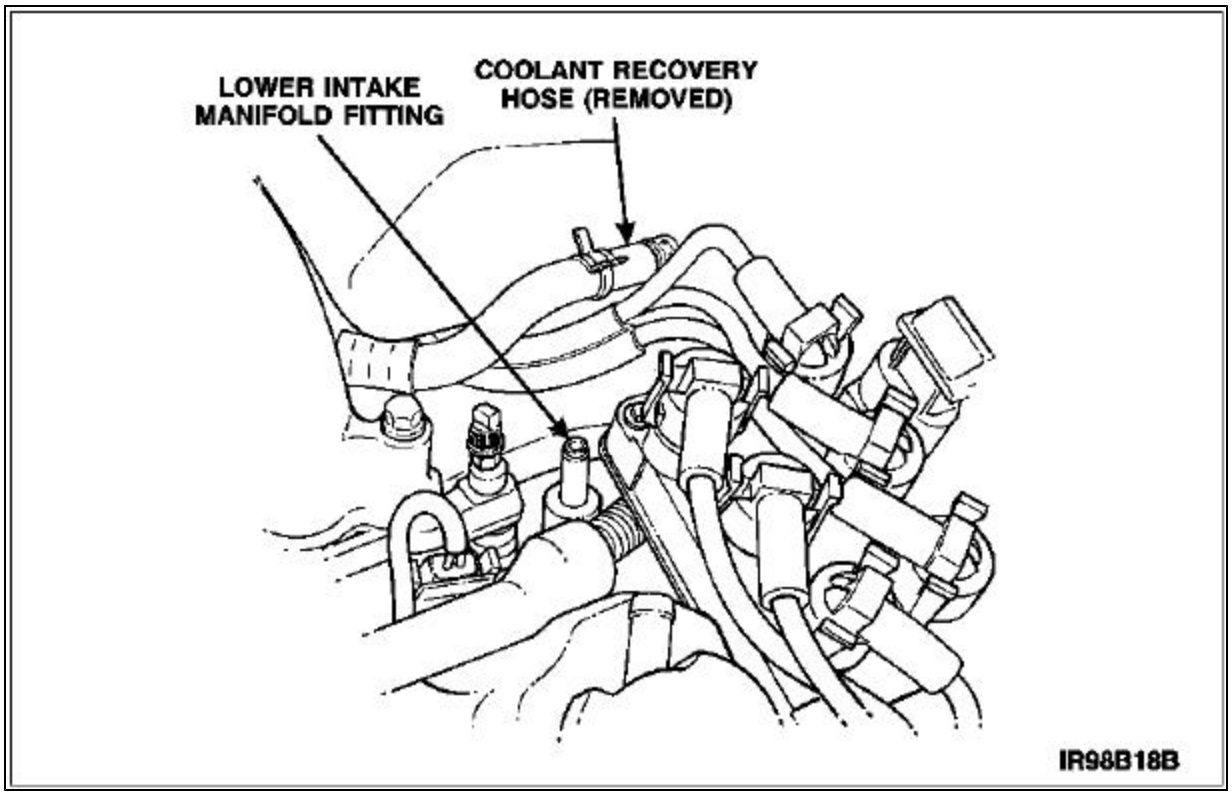

Figure 2

9. With suitable driver, shown in Figure 3, install restrictor insert (F7PE-8N030-AA) as shown in Figure 4. Restrictor insert must be installed flush to the shoulder on the coolant recovery fitting. It is acceptable if the restrictor insert is loose in the fitting.

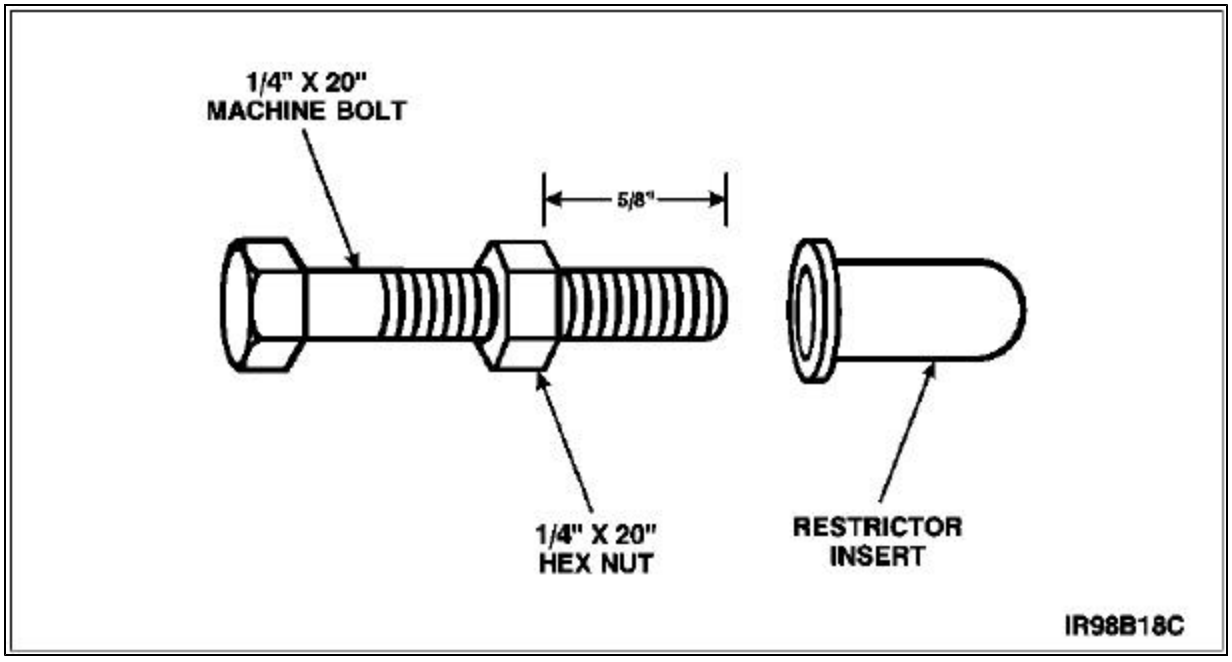

Figure 3

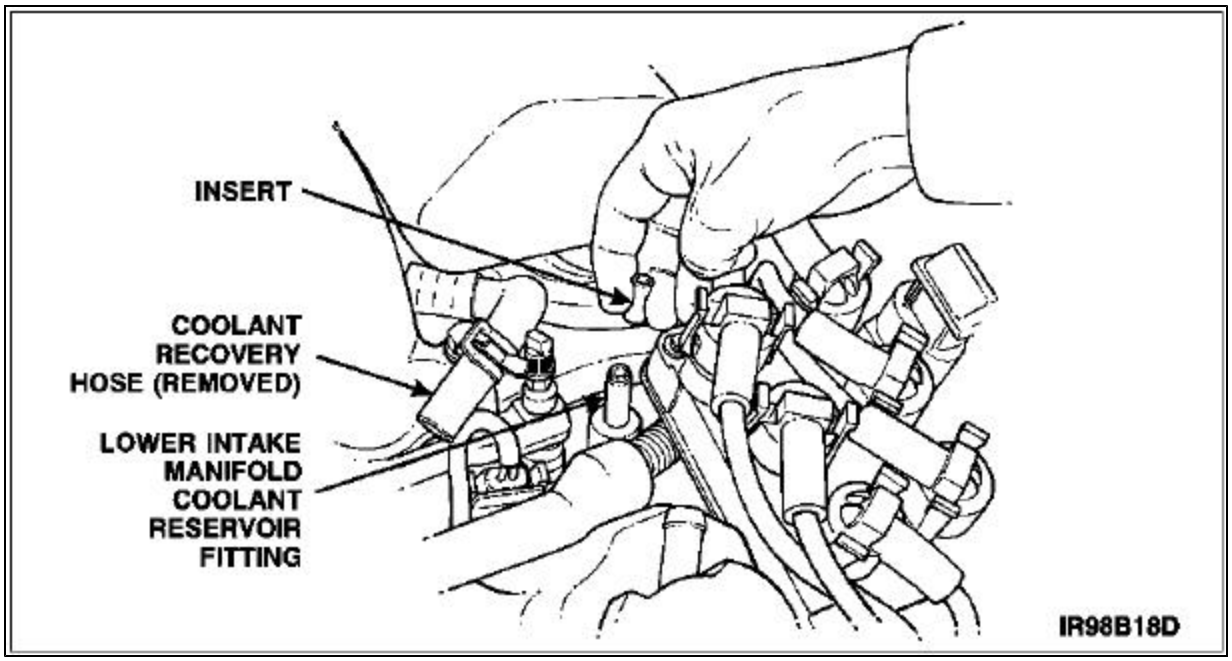

Figure 4

10. Reinstall coolant recovery hose and clamp.
11. Remove heater return hose from the water pump and heater core return tube.
12. Remove fuel vapor hose clip from the stud on the dash panel. Install the new clip and fasten the nut, securing the clip. Reinstall the fuel vapor hose clip. See Figure 5.

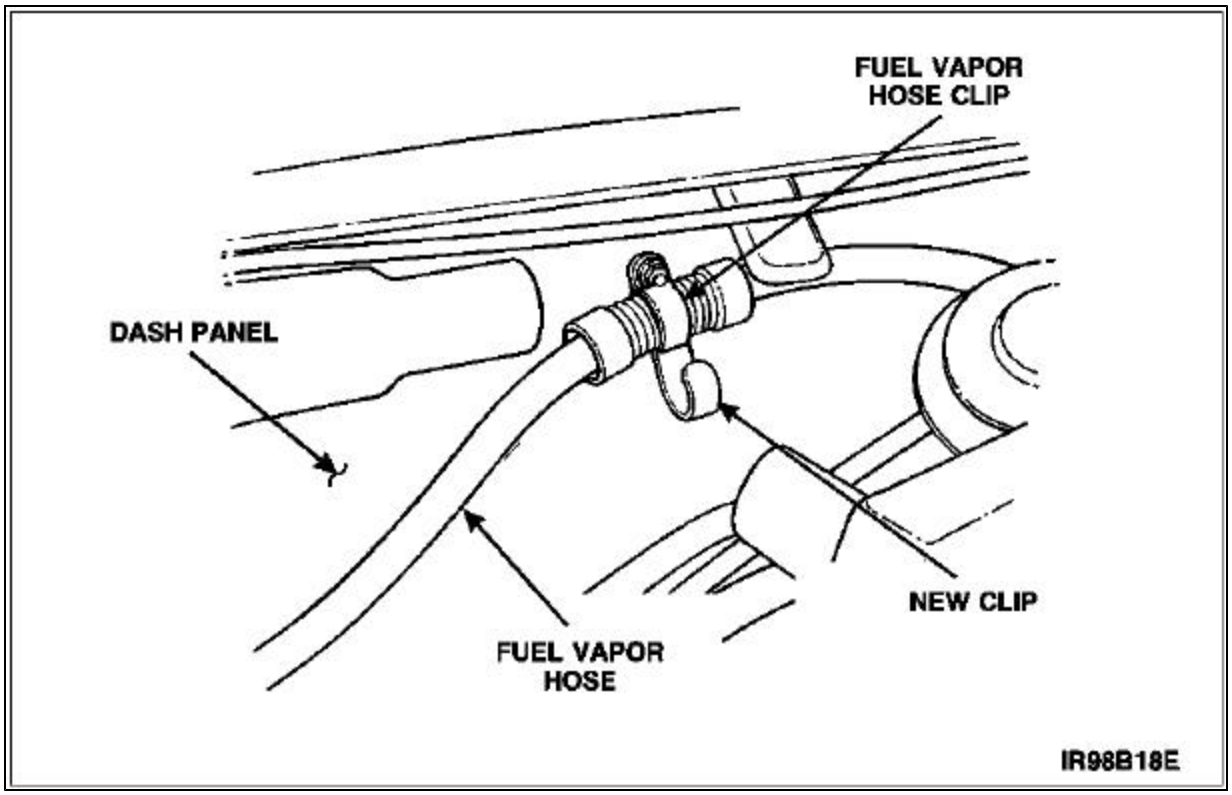

Figure 5

13. Install the coolant by-pass hose at the water pump and at the heater core return tube connection, located at the dash panel. See Figure 6. Install the clamps at both connections inside "H" marking.

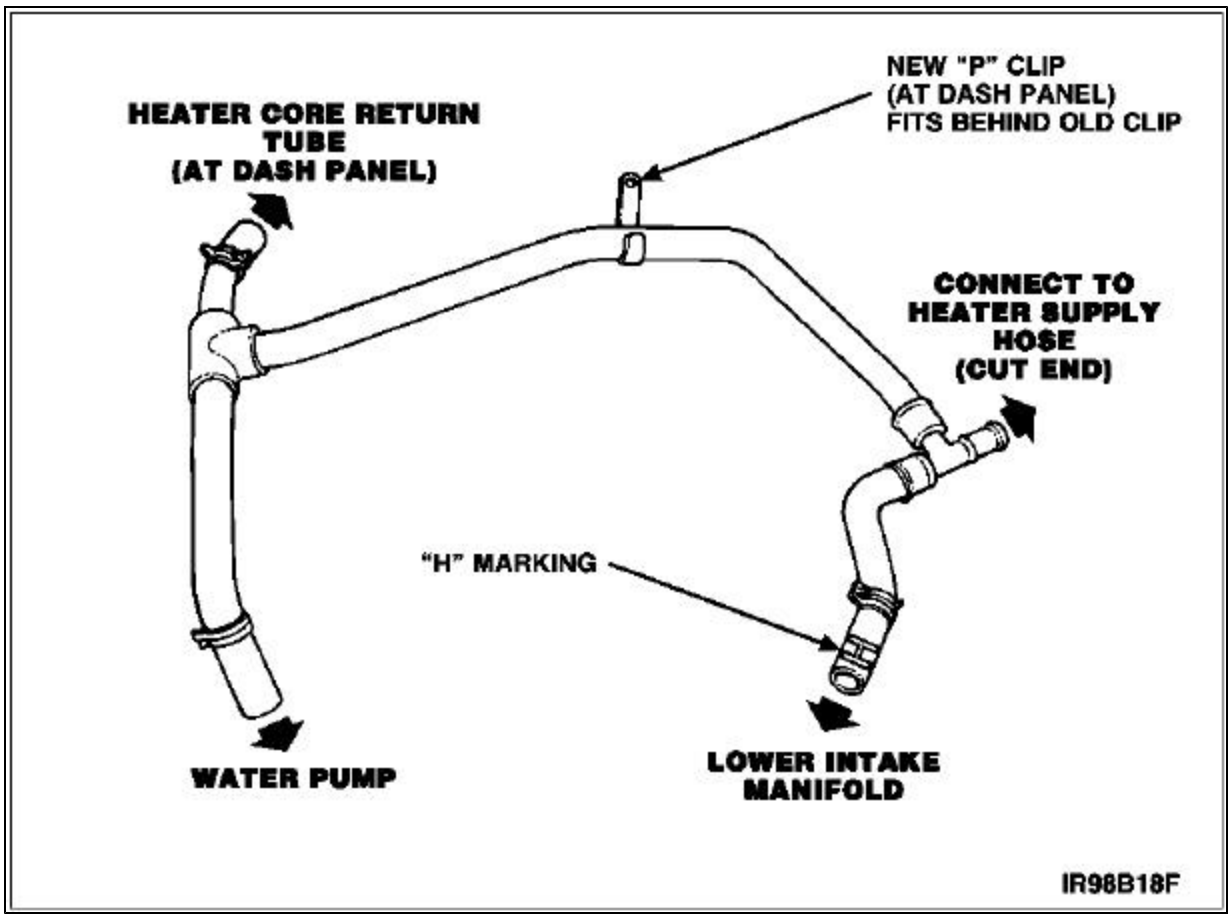

Figure 6

14. Remove the heater supply hose from the lower intake manifold, See Figure 7, and leave it hanging loose.

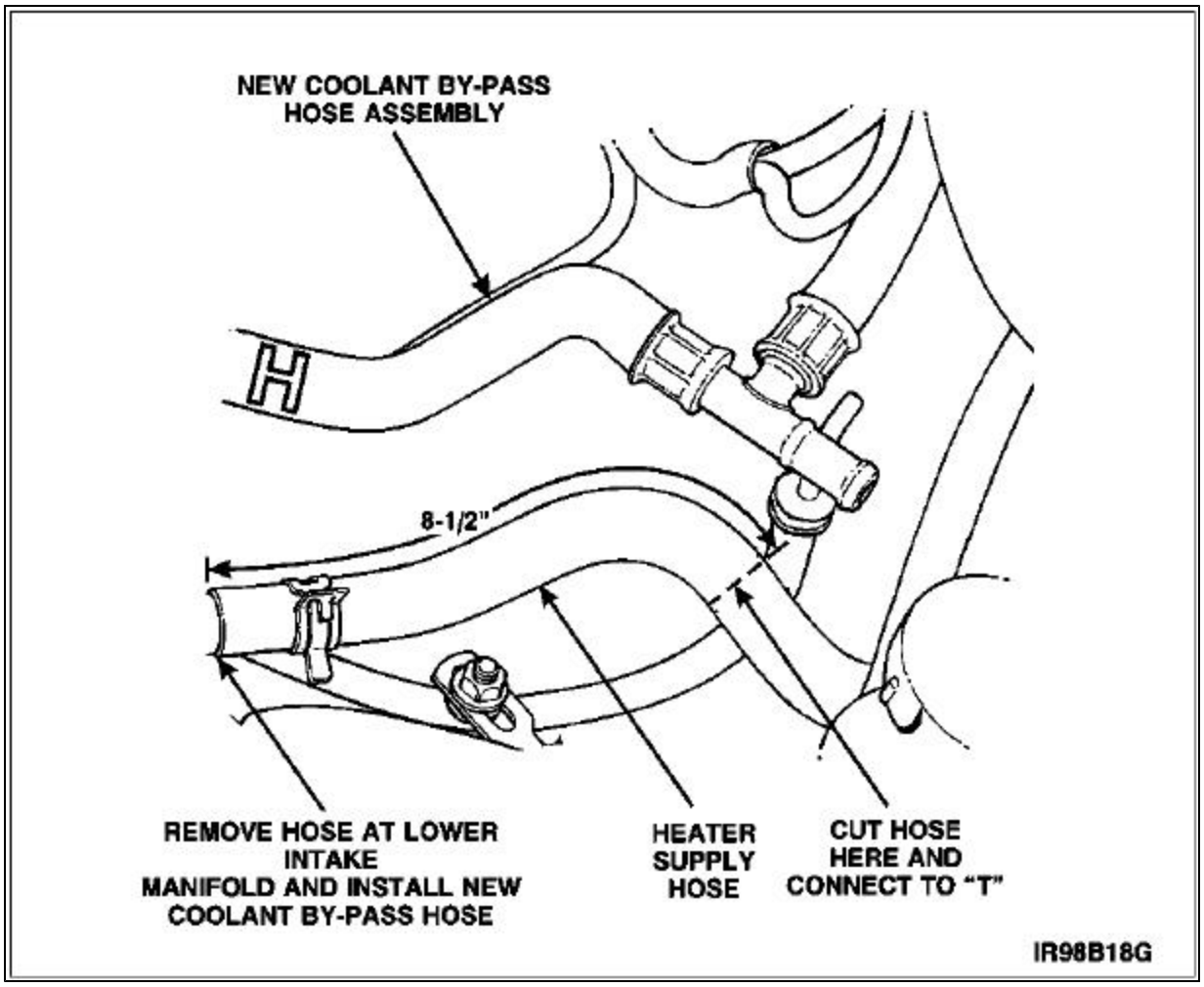
NEW COOLANT BY-PASS HOSE ASSEMBLY
H
8-1/2"
REMOVE HOSE AT LOWER INTAKE MANIFOLD AND INSTALL NEW COOLANT BY-PASS HOSE
HEATER SUPPLY HOSE
CUT HOSE HERE AND CONNECT TO "T"
IR98B18G

Figure 7

NOTE:
The "H" marking on the hose must be in the straight-up position.

15. Install the coolant by-pass hose to the lower intake manifold heater supply fitting and install clamp inside "H" marking. Refer to Figure 6 and 7.

NOTE:
Check by-pass hose assembly for possible kinks or possible interference with the transmission dipstick and ETA check valve.

16. Cut the heater supply hose approximately 8-1/2 inches from the original connection at the lower intake manifold. Install existing clamp on the remaining heater supply hose. Install the heater supply hose to the "tee" on the coolant by-pass. See Figure 7. Install hose clamp on "tee" connection.
17. Reinstall clean air tube.
18. Push (fasten) new coolant by-pass hose into the new clip on the dash panel. See Figure 8.

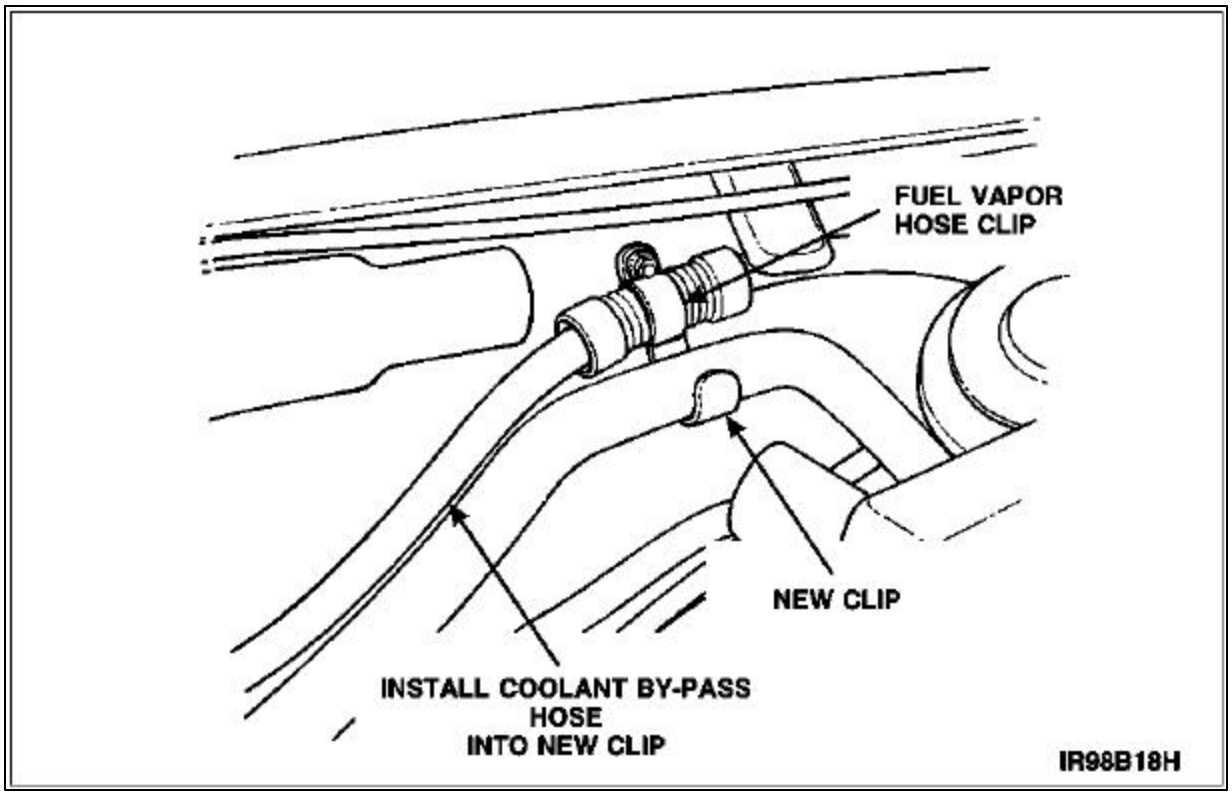

Figure 8

19. Raise vehicle.
20. Install splash shield.
21. Lower vehicle.

CAUTION
Use extreme care to keep coolant mixture off of the drive belt and pulleys. If needed, remove drive belt and rinse with clear water. Clean pulleys and install drive belt. Belt squeal and early drive belt fatigue will occur otherwise.

22. Add **new** 50/50 coolant mixture into fill neck on coolant recovery bottle until coolant reaches top of cold fill range mark on bottle.
23. Install pressure relief cap on coolant recovery bottle.
24. Select maximum heater temperature and blower motor speed settings. Position control to discharge air at A/C vents in the instrument panel.
25. Start engine and allow to idle. While engine is idling, feel for hot air at A/C vents.

CAUTION
If air discharge remains cool and engine coolant temperature gauge does not move, engine coolant level is low in engine and must be filled. Stop engine, allow to cool and fill cooling system as described.

26. Start engine and allow to idle until normal operating temperature is reached. Hot air should discharge from A/C vents. The engine coolant temperature gauge should maintain a stabilized reading to within the NORMAL range and the upper radiator hose should feel hot to the touch.
27. Shut engine off and allow to cool.
28. Check engine for coolant leaks.